

1 WHAT IS CLAIMED IS

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1. A system for mobile communication based on code division multiple access, comprising:

base stations, each of which communicates with mobile stations by using a plurality of radio frequencies covering respective cells, the respective cells including a first cell covered by a first radio frequency and a second cell covered by a second radio frequency; and

15 a base-station controller which communicates with said base stations, and controls the mobile stations to switch from the first cell of a first base station to the first cell of a second base station via a soft hand-off operation and switch between the first cell and the second cell within any base station via a 20 hard hand-off operation, said base-station controller providing the mobile stations with no direct switch between the second cell of said first base station and the second cell of said second base station.

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30 2. The system as claimed in claim 1, wherein the first cell is larger than and fully encompasses the second cell.

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3. The system as claimed in claim 2, wherein said base-station controller controls the mobile stations to switches from the first cell to the second

1 cell as the mobile stations enter the second cell, and
controls the mobile stations to switches from the
second cell to the first cell as the mobile stations
exit the second cell.

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4. The system as claimed in claim 1, wherein
10 each of said base stations transmits only the first
radio frequency when a number of the mobile stations
belonging to the first cell thereof is smaller than a
given threshold, and transmits the second radio
frequency in addition to the first radio frequency when
15 the number exceeds the given threshold, and wherein
said base-station controller controls some of the
mobile stations to switch from the first cell to the
second cell as transmission of the second radio
frequency starts.

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5. The system as claimed in claim 4, wherein
25 the respective cells further include a third cell
covered by a third frequency, and each of said base
stations does not transmit the third radio frequency
when a number of the mobile stations belonging to the
second cell thereof is smaller than another given
30 threshold, and transmits the third radio frequency in
addition to the second radio frequency when the number
exceeds said another given threshold, and wherein said
base-station controller controls some of the mobile
stations to switch from the second cell to the third
35 cell as transmission of the third radio frequency
starts.

1 6. The system as claimed in claim 4, wherein
transmission and non-transmission of the second
frequency is determined by incorporating a hysteresis
characteristic into a relation between the number of
5 the mobile stations and the given threshold.

10 7. The system as claimed in claim 4, wherein
a period of transmission and a period of non-
transmission of the second frequency is controlled to
last for at least a predetermined time period.

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20 8. The system as claimed in claim 1, wherein
the respective cells further include a third cell
covered by a third frequency and fully encompassed by
the second cell, and wherein the mobile stations switch
from the second cell to the third cell when the mobile
stations enter the third cell.

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30 9. A mobile station, comprising:
a searcher which searches for pilot signals
of surrounding base stations; and
a searcher-stop-control unit which stops said
searcher from searching for the pilot signals when said
mobile station is currently using a radio frequency
that does not permit a soft hand-off operation.

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10. A base-station controller used in a code-

1 division-multiple-access mobile communication system,
comprising:

5 first units, each of which decodes a signal sent from a mobile station, and is provided with a selection function to select said signal from two signals that are sent from the mobile station as a single signal and routed through two respective base stations; and

10 second units, each of which decodes a signal sent from a mobile station, and is not provided with the selection function, wherein a mobile station using a radio frequency permitting a soft hand-off operation is assigned to one of said first units, and a mobile station using a radio frequency not permitting a soft-hand-off operation is assigned to one of said second units.

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11. A system for mobile communication based on code division multiple access, comprising base stations, each of which communicates with mobile stations by using a plurality of radio frequencies covering respective cells, the respective cells including a first cell covered by a first radio frequency and a second cell covered by a second radio frequency, wherein the first cell of one of said base stations overlaps the first cell of another one of said base stations while the second cell of the one of said base stations do not overlap the second cell of said another one of said base stations.

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12. A mobile station for use in the system of

1 claim 1, comprising a searcher which searches for pilot
signals of the base stations only with respect to the
first radio frequency.

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